UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,244	04/13/2007	Kozue Hamamoto	295790US8PCT	9282

22850 7590 07/22/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
SIVJI, NIZAR N	
ART UNIT	PAPER NUMBER
2617	

NOTIFICATION DATE	DELIVERY MODE
07/22/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/591,244	HAMAMOTO ET AL.	
	Examiner	Art Unit	
	NIZAR SIVJI	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of the Claims

1. Claims 1-28 are currently pending in this application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 7-10, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karabinis et al. Pub. No. 2004/0023658 in view of Uddenfeldt U.S. Patent No. 5,805,633.

Regarding Claim 7, Karabinis discloses (Fig. 5 and Para 109) a base station for performing radio communication with mobile stations, using frequency channels in radio communications systems; a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio communications systems(Para 109-120, BSC or a

satellite controls and manages radio resources of the BTS and assign a frequency channel within a frequency band); a channel status information collection function configured to collect channel status information showing status of frequency channels at the base station (Para 109-120, BSC or a satellite controls and manages radio resources of the BTS and assign a frequency channel within a frequency band); a frequency channel selection function configured to select frequency channels for use between the base station and the mobile stations, based on the system characteristics information and the channel status information (Para 157, assignment frequencies can be based on load and/or capacity). Karabinis discloses (Para 157 – 163), frequency channel assignment can be based on load and/or capacity and the determination is made whether the cell or coverage area to which the frequencies are to be assigned, reused and/or shared is substantially equidistant from the cell or coverage area from which they are taken. If not, the frequencies associated with a cell or coverage area furthest away from the coverage area to which the frequencies are to be assigned, reused and/or shared are preferably used so as to avoid inter-system interference). Karabinis differ from the claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping

use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further, (Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of

Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 8, Karabinis discloses further a measurement function configured to measure at least one of call loss probability and traffic at the base station; and a required frequency channel number calculation function configured to calculate the number of frequency channels required at the base station based on at least one of the call loss probability and the traffic at the base station; wherein the frequency channel selection function is configured to select frequency channels for use between the base station and the mobile stations, based on the system characteristics information, the channel status information, and the required number of frequency channels (Para 157 – 163).

Regarding Claim 9, Karabinis discloses a control station for controlling a plurality of base stations in radio communications systems (Fig. 5), comprising: a channel status information collection function configured to collect channel status information showing status of frequency channels at each of the base stations(Para 109-120); and a required frequency channel number calculation function configured to calculate the numbers of frequency channels required at the base stations, based on at least one of call toss probability and traffic at the base stations(Para 157 – 163), wherein the control station is configured to select frequency channels for use between the base stations and mobile stations based on the system characteristics information, the channel status information, and the required numbers of frequency channels (Para 157). Karabinis differ from the claimed invention in not specifically teaching common frequency band in

a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further, (Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use

frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 10, Karabinis discloses an inter-system common control apparatus connected to a plurality of radio communications systems (fig. 5 Unit 508), comprising: a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio communications systems(Para 109, switching function and provides connection to other network); a collection function configured to collect channel status information showing status of frequency channels at base stations in the radio communications systems and the numbers of frequency channels required at the base stations, from control stations in the radio communications systems; a frequency channel assignment function configured to assign frequency channels to each of the radio communications systems based on the managed system characteristics information (Para 110, NOC 506 monitor the satellite 516 transponders to ensure that they are maintained within frequency assignment and power allocation tolerances. The NOC also optionally performs priority and preemption to ensure that communication resources are available and/or assigned, reused and/or borrowed in a timely manner), and the channel status information and the required numbers of frequency channels notified from the control

stations; and a frequency channel communication function configured to notify the assigned frequency channels to the control stations in the radio communications systems(Para 110, the NOC maintains cognizance of the availability of satellite and/or terrestrial resources and arranges for any necessary satellite reconfiguration and/or assignment and or reuse of frequencies to meet changed traffic patterns). Karabinis differ from the claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further,

(Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 12, Karabinis discloses collecting, at a controller, channel status information showing status of frequency channels at each of the base stations; calculating, at the controller, the number of frequency channels required at each of the base stations based on the collected channel status information (Para 109, The BSC 510 generally controls one or more BTSs 514 and manages their radio resources. BSC 510 is principally in charge of handovers, frequency hopping, exchange functions and control of the radio frequency power levels of the BTSs 514); assigning, at the controller, frequency channels to each of the radio communications systems, based on system characteristics information showing characteristics of frequency channels in the radio communications systems, the channel status information, and the required

number of frequency channels (Para 109, radio resources); notifying, at the controller, the assigned frequency channels to the base stations; and performing, at the base stations, radio communication with the mobile stations, using the frequency channels notified from the controller (Para 109, handover, frequency hopping, exchange function and control of the radio frequency power levels of the BTS). Karabinis differ from the claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further,

(Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 13, Karabinis discloses collecting, a the base stations, channel status information showing status of frequency channels at the base stations (Para 110); managing, at the base stations, system characteristics information showing characteristics of frequency channels in the radio communications systems (Para 109-120); calculating, at the base stations, the numbers of frequency channels required at the base stations, based on at least one of call loss probability and traffic at the base stations(Para 157 – 163); and selecting, at the base stations, frequency channels for use between the base stations or the other base stations and the mobile stations, based on the system characteristics information, the channel status information and the required numbers of frequency channels (Para 157 – 163). Karabinis differ from the

claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further, (Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system

characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 14, Karabinis discloses collecting, at the control station, channel status information showing status of frequency channels at the base stations(Para 110); calculating, at the control station, the numbers of frequency channels required at the base stations, based on at least one of call loss probability and traffic at the base stations(Para 109-120); and selecting, at the control station, frequency channels for use between the base stations and mobile stations, based on the system characteristics information, the channel status information, and the required numbers of frequency channels(Para 157 – 163). Karabinis differ from the claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to

the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station 610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further, (Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 17, Uddenfeldt disclose wherein the base station assigns the first frequency channels included in the first occupied use frequency band or the third frequency channels included in the overlapping use frequency band to mobile stations included in the first radio communications system, and the base station assigns the second frequency channels included in the second occupied use frequency band or the third frequency channels included in the overlapping use frequency band to mobile stations included in the second radio communications system(Col 8 L 50 – Col 9 L 35).

Regarding Claim 18, Uddenfeldt disclose wherein the base station searches as to whether there is a first unused frequency channel in the first occupied use frequency band when a mobile station performs call processing, the base station assigns the first unused frequency channel to the mobile station when the first unused frequency channel exists in the first occupied use frequency band, the base station searches as to whether there is a third unused frequency channel in the overlapping use frequency band when the first unused frequency channel does not exist in the first occupied use frequency band, and the base station assigns the third unused frequency channel to the mobile station when the third unused frequency channel exists in the overlapping use frequency band (Col 9 L 50 – Col 10 L 30).

Regarding Claim 19, Claim 19 has been rejected for the same reason as disclosed in Claim 17.

Regarding Claim 20, Claim 20 has been rejected for the same reason as disclosed in Claim 18.

Regarding Claim 21, Claim 21 has been rejected for the same reason as disclosed in Claim 17.

Regarding Claim 22, Claim 22 has been rejected for the same reason as disclosed in Claim 18.

Regarding Claim 23, Claim 23 has been rejected for the same reason as disclosed in Claim 17.

Regarding Claim 24, Claim 24 has been rejected for the same reason as disclosed in Claim 18.

Regarding Claim 25, Claim 25 has been rejected for the same reason as disclosed in Claim 17.

Regarding Claim 26, Claim 26 has been rejected for the same reason as disclosed in Claim 18.

Regarding Claim 27, Claim 27 has been rejected for the same reason as disclosed in Claim 17.

Regarding Claim 28, Claim 28 has been rejected for the same reason as disclosed in Claim 18.

1. Claims 1-6, 11, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Karabinis et al. Pub. No. 2004/0023658 in view of Henson et al. Patent No. 5974324 and further in view of Uddenfeldt Patent No. 5, 805, 633.

Regarding Claim 1,Karabinis discloses a frequency channel assignment system comprising a plurality of radio communications systems which use a common frequency band, and a controller (Para 109 and Fig. 5, a system that utilize frequency reuse

scheme in which multiple base transceiver station having a single base station controller controlled by mobile switching center. The BSC controls one or more BTS and manage their radio resources. BSC is principally in charge of handovers, frequency hopping, exchange function and control of the radio frequency power levels of the BTS); wherein the controller comprises: a system characteristics information management function configured to manage system characteristics information showing characteristics of frequency channels in the radio communications systems (Para 109-120, BSC or a satellite controls and manages radio resources of the BTS and assign a frequency channel within a frequency band); and a frequency channel assignment function configured to assign the frequency channels to each of the radio communications systems, based on the system characteristics information and channel status information showing status of the frequency channels, (Para 157 – 163, frequency channel assignment can be based on load and/or capacity and the determination is made whether the cell or coverage area to which the frequencies are to be assigned, reused and/or shared is substantially equidistant from the cell or coverage area from which they are taken. If not, the frequencies associated with a cell or coverage area furthest away from the coverage area to which the frequencies are to be assigned, reused and/or shared are preferably used so as to avoid inter-system interference.). Karabinis discusses that interference can be avoided by controlling the channel reuse distance. Karabinis differs from the claimed invention in not specifically teaching to avoid inter-system interference. However, Henson discloses (Col 3 L 45 – Col 4 L 15) that frequency channels are assigned sequentially to each frequency channel group and

each frequency channel group is then associated with each cell in a manner that eliminates adjacent frequency channels within the cluster and with respect to adjusted clusters. These same frequencies, after being assigned to the first cluster, may then be reused by other clusters according to the assignment configuration. The interference can be avoided between the co-channels by keeping the distance between the two cells utilizing the same frequency channels. The greater the reuse distance, the lesser the chance of co-channel interference. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that to avoid inter-system interference as per teaching of Henson so as to re-use frequency channel within each clusters without any distortion. Karabinis and Henson differ from the claimed invention in not specifically teaching common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems. However, Uddenfeldt disclose (Col 5 L 55 – Col 6 L 55) Fig. 6 three independent radio communication system A, B, C to provide service over a particular geographic region having cells 600A, 600B and 600c which may or may not be substantially overlapping where the management of the radio system A, B and C provide coverage to the region labeled Cell A600A from base station

610A, Cell B 600B from base station 610B and Cell C 600C from base station 610C respectively where MTSO 620A, 620B and 620C provides the interface to other base stations covering other regions controlled by radio communication system) and (Col 6 L 55-60) each base station 610A-C is assigned a control channel frequency band denoted Fa-Fc. Further, (Col 8 L 65- Col 9 L 35) disclose frequency band available to only to single system and frequency band that is shared between the communication system. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that common frequency band in a common geographical area and the controller determining, within a range of the common frequency band and based on the system characteristics information and the channel status information: a first occupied use frequency band which includes first frequency channels available only to a first radio communications system, a second occupied use frequency band which includes second frequency channels available only to a second radio communications system, and an overlapping use frequency band which includes third frequency channels available to the first and second radio communications systems as per teaching of Uddenfeldt so as to reduce co-channel interference between independent radio communication systems.

Regarding Claim 2, Karabinis discloses the controller further comprises a required frequency channel calculation function configured to calculate the number of frequency channels required at a base station, based on at least one of call loss probability and traffic at the base station; the frequency channel assignment function configured to assign the frequency channels to each of the radio communications systems, based on

the system characteristics information, the channel status information, and the required number of frequency channels, so as to avoid inter-system interference (Para 157 – 163).

Regarding Claim 3, Karabinis discloses wherein the controller comprises a control apparatus provided in each of the plurality of radio communications systems, and an inter-system common control apparatus connected to the plurality of radio communications systems (Fig. 5); the control apparatus comprises (Fig. 5 BSC): a function of collecting the channel status information; a function of calculating the required number of frequency channels; and a notification function configured to notify the required number of frequency channels and the channel status information to the inter-system common control apparatus (Para 109-110); and the inter-system common control apparatus comprises (Fig. 5 MSC): a function of managing the system characteristics information; a function of assigning the frequency channels; and a frequency channel notification function configured to notify the assigned frequency channels to each of the control apparatuses (Para 109-110).

Regarding Claim 4, Karabinis discloses wherein the inter-system common control apparatus is provided in a control station in a given radio communications system of the plurality of radio communications systems (Fig. 5, MSC connected with multiple BSC).

Regarding Claim 5, Henson discloses further wherein, as the system characteristics information, at least one of overlapping use possibility on the frequency channels, priority of assigning the frequency channels the allowable amount of interference on the frequency channels and frequency bandwidth used on the frequency channels is used

(Col 6 L 4 – 68).

Regarding Claim 6, Karabinis discloses wherein, as the channel status information, at least one of use status of the frequency channels, the amount of interference on the frequency channels, and radio path change on the frequency channels is used (Para 41).

Regarding Claim 11, Karabinis and Uddenfeldt differ from the claimed invention in not specifically teaching wherein for each frequency channel available at the base stations in the radio communications systems, at least one of overlapping use possibility on the frequency channel, priority of assigning the frequency channel, the allowable amount of interference on the frequency channel, and frequency bandwidth used on the frequency channel is managed as the system characteristics information. However, Henson discloses (Col 6 L 4 – 68) reuse of the frequency channels where different sector within same cell group having the same subscript label is reused within that particular sector. For example, in case sector A1.sub.1 needs to be assigned more frequency channels for additional call capacity, a frequency channel previously assigned to sector A2.sub.1 (belonging to the same cell group A and having the same subscript label one) is reused within sector A1.sub.1. Similarly, A1.sub.1 may reuse frequency channels previously assigned to A3.sub.1, A4.sub.1, A5.sub.1, A6.sub.1, and A7.sub.1. Since, sector A1.sub.1 was initially assigned frequency channels numbers two (2) and one-hundred-forty-nine (149), reusing frequency channels twenty-three (23) and one-hundred-seventy (170), for example from sector A2.sub.1, decreases the difference in channels numbers to the magnitude of twenty-one (21). Accordingly, as far as those two sectors

are concerned, they are using the 7/21 reuse plan as in FIG. 1. Further, as sectors utilize all of the frequency channels assigned to other sectors within the same cell group with the same subscript label, each cluster will be utilizing the same frequency channels transforming the modified 49/147 plan into the target 7/21 plan. In order to handle maximum capacity, sector A1.sub.1 uses all frequency channels assigned to sector A2.sub.1 as well as frequency channels from all other sectors within the same cell group with the same subscript label. The rest of the sectors similarly reuse frequency channels previously assigned to other sectors. Since, the frequency channels being used by the two sectors are the same within a particular modified cluster, the reuse distance is accordingly reduced and an increase in co-channel interference is effectuated. As a result, the overall reuse plan is ultimately changed into the originally targeted 7/21 reuse plan. Therefore, it is obvious to one having ordinary skill in the art at the time the invention was made that for each frequency channel available at the base stations in the radio communications systems, at least one of overlapping use possibility on the frequency channel, priority of assigning the frequency channel, the allowable amount of interference on the frequency channel, and frequency bandwidth used on the frequency channel is managed as the system characteristics information as per teaching of Henson so as to re-use frequency channel within each clusters without any distortion.

Regarding Claim 15, Uddenfeldt disclose further wherein the controller assigns the first frequency channels included in the first occupied use frequency band or the third frequency channels included in the overlapping use frequency band to mobile stations

included in the first radio communications system, and the controller assigns the second frequency channels included in the second occupied use frequency band or the third frequency channels included in the overlapping use frequency band to mobile stations included in the second radio communications system (Col 8 L 50 – Col 9 L 35).

Regarding Claim 16, Uddenfeldt disclose the controller searches as to whether there is a first unused frequency channel in the first occupied use frequency band when a mobile station performs call processing, the controller assigns the first unused frequency channel to the mobile station when the first unused frequency channel exists in the first occupied use frequency band, the controller searches as to whether there is a third unused frequency channel in the overlapping use frequency band when the first unused frequency channel does not exist in the first occupied use frequency band, and the controller assigns the third unused frequency channel to the mobile station when the third unused frequency channel exists in the overlapping use frequency band (Col 9 L 50 – Col 10 L 30).

Response to Arguments

Applicant's arguments with respect to claims 1-28 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Channel Assignment Schemes for Cellular Mobile Telecommunication Systems: A Comprehesive Survey, IEEE Personal Communication, June 1996, I. Katzela and M. Naghshineh

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NIZAR SIVJI whose telephone number is (571)270-7462. The examiner can normally be reached on 7:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Eng/
Supervisory Patent Examiner, Art Unit 2617

/NIZAR SIVJI/
Examiner, Art Unit 2617